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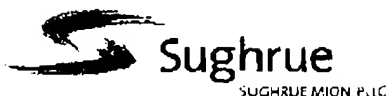
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Date May 30, 2003

To Examiner Karl Tamai

Of U.S. PATENT AND TRADEMARK OFFICE

Fax (703) 746-4173

From Christopher R. Lipp

Subject U.S. Application No. 09/277,198

Our Ref Q53565

Pages 16
(including cover sheet)

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Dear Examiner Tamai:

Per our telephone conversation of May 29, 2003, faxed herewith is a copy of the Appellants' Brief on Appeal filed December 11, 2002 in the U.S. Patent and Trademark Office. Also included is a copy of our date-stamped filing receipt, as stamped received by the U.S.P.T.O.

Please call me with any further questions and/or concerns.

Sincerely,

A handwritten signature in dark ink, appearing to read "C. Lipp", is written over the typed name.

Christopher R. Lipp
Registration No. 41,157

80

FILING RECEIPT
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In re application of

Yoshihito ASAO

Appln. No.: 09/277,198

Confirmation No.: 3195

Filed: March 26, 1999

For: STATOR FOR AN AUTOMOTIVE ALTERNATOR AND METHOD OF
MANUFACTURE THEREFOR



Group Art Unit: 2834

Examiner: K. Tamai

PAPER(S) FILED ENTITLED:

1. Appellants' Brief on Appeal Under 37 C.F.R. §1.192 (in triplicate)
2. Submission of Appellant's Brief on Appeal (w/no fee)
3. Request for Refund

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DOCKET NO.: Q53565

ATTORNEY/SEC: RCT/CRL/tlb

Date Filed: December 11, 2002

WASHINGTON OFFICE



23373

PATENT TRADEMARK OFFICE

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Docket No: Q53565

Yoshihito ASAO

Appln. No.: 09/277,198

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For: STATOR FOR AN AUTOMOTIVE ALTERNATOR AND METHOD OF
MANUFACTURE THEREFOR

SUBMISSION OF APPELLANT'S BRIEF ON APPEAL

FILEDCommissioner for Patents
Washington, D.C. 20231

DEC 11 2002

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. Since prosecution was reopened by the Examiner via the Office Action dated December 3, 2001 after the filing of a Notice of Appeal on August 7, 2001 and an Appeal Brief on October 9, 2001, the Appeal Brief fee of \$320 submitted with the Appellant's Brief on Appeal filed October 9, 2001 should be applied to this Appellant's Brief on Appeal and no further fee is submitted herewith (MPEP 1208.02).

However, the USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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WASHINGTON OFFICE



23373

PATENT TRADEMARK OFFICE

Date: December 11, 2002

Attorney Docket No.: Q53565

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
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For: STATOR FOR AN AUTOMOTIVE ALTERNATOR AND METHOD OF
MANUFACTURE THEREFOR

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Commissioner for Patents
Washington, D.C. 20231**FILED**

DEC 11 2002

Sir:

This is an Appeal from the final rejection of June 11, 2002 (Paper No. 24) of claims 1-4 in Application No. 09/277,198. In accordance with the provisions of 37 C.F.R. § 1.192, Appellant submits the following:

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Mitsubishi Denki Kabushiki Kaisha. Assignment of the application was submitted to the U.S. Patent and Trademark Office on March 26, 1999, and recorded on the same date at Reel 9863, Frame 0775.

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II. RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that will affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-15 are pending in the application with claims 5-15 being withdrawn from consideration as being directed to a non-elected invention. As set forth in the Final Office Action dated June 11, 2002, claims 1-4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Adachi et al. (Japanese Patent Publication No. JP 9-103052; hereafter "Adachi") in view of King (U.S. Patent No. 3,531,672). Further, claims 2 and 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Adachi in view of King and Schonfeldcer (U.S. Patent No. 2,234,903). All of the rejected claims are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

No claim amendments were requested subsequent to the Office Action of June 11, 2002.

V. SUMMARY OF THE INVENTION

The present invention is directed to a stator for an automotive alternator system which innovatively improves power generation efficiency, thermal conductivity and winding density while reducing size, lowering weight, reducing auditory noise, reducing electromagnetic noise

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and reducing damage to the stator coil due to abrasion, shorting and thermal breakdown. More particularly, the present invention relates to a stator including a stator core and a stator coil, wherein the stator coil has end portions which are reduced in size as compared with the prior art. These reduced stator coil end portions provide several benefits including, *inter alia*: reduced weight and cost due to the reduction in coil materials; a more dense and compact coil allowing for greater power generation efficiency; reduced coil resistance resulting in improved power generation efficiency and reduced thermal generation; increased thermal conductivity due to the reduced distance (gaps) between the stator coil end portions and the stator core; decreased wind resistance and wind noise due to reduction in size; and increased rigidity of the stator due to the reduced distance between the stator coil end portions and the stator core, which results in a reduction in electromagnetic noise as well as physical coil damage due to vibrations of the coil ends (page 4, line 9-page 6, line 12).

Accordingly, it is an object of the present invention to provide a lightweight, low-cost stator which efficiently generates power while producing less noise (page 6, lines 14-19). Moreover, the stator must be easily assembled with a minimum of damage to attain this object (page 5, lines 11-33).

Referring to Figures 2 and 8, in order to achieve the above-noted object, the stator 90 includes a stator coil 92 secured to a stator core 91, the stator coil having axial parallel portions 921a which are substantially parallel to the central axis of the stator 92, and coil ends 92b which project beyond the end surfaces 91b of the stator core slots 91a connecting the axial parallel

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portions 921a. These coil ends 92b include bridge portions 921b connecting projecting parallel portions 921a2. (page 9, line 30 - page 10, line 1).

The axially parallel portions 921a include current generating portions 921a1 disposed within the slots 91a and generating electric current, and projecting parallel portion 921a2 extending beyond the end surfaces 91b of the slots 91a. The bridge portions 921b and the projecting parallel portions 921a2 of the axially parallel portions 921a are exposed projecting portions projecting from the stator core 91 which form the coil ends 92b of the stator coil 92. (page 10, lines 1-8).

The inner circumferential surfaces of the bridge portions 921b are formed so as to be in contact with the end surfaces 91b of the stator core 91 without any gaps in the direction of the central axis of the stator core 91. As a result, the stator coil 92 consists substantially of the current generating portions 921a1 and the bridge portions 921b only, with few or no projecting parallel portions 921a2. Further, the spatial ratio occupied by the bridge portions 921b of the stator coil 92 in the clusters of stator windings within the coil ends 92b has a high density. Thus, there is very little gap between the three phases of windings, as well as the stator core. (page 10, lines 11-18).

Referring to Figures 2 -4, the stator core 91 is formed from strips of thinly rolled and punched sheet metal 99 which are assembled into a laminated body 95. The strips include a band portion 91h, rectangular teeth 91c parallel to one another and perpendicular to the band portion, recess portions 91j opposite the teeth 91c in the band portion 91h, grooves 91k in teeth 91c, and

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recess portions 91p disposed on side surfaces 91m of the teeth 91c. (page 10, line 31 - page 11, line 12).

Referring to Figures 5-7, the stator coil 92 is assembled to the laminated body 95, over the teeth 91c into the slots 91a. Once properly inserted, the ends 91d of the teeth 91c are extended longitudinally into the area of the slots 91a forming projecting portions 91r. Then the laminated body 95 is bent into a cylindrical shape and welded (91s, Figure 2) to form the completed stator core 91, and resulting completed stator 90. (page 11, lines 13 - page 12, line 20).

VI. ISSUES

Whether claims 1-4 were erroneously rejected 35 U.S.C. § 103(a) as being unpatentable over Adachi and King?

VII. GROUPING OF CLAIMS

Appellant submits that claims 1-4 stand and fall together. Reasons for patentability are set forth below.

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VIII. ARGUMENTS

Appellant's claimed invention clearly defines over Adachi in view of King, because Adachi in combination with King does not disclose, teach or suggest Appellant's claimed stator for an automotive alternator, as set forth below.

Claim 1 (the only independent claim) requires, in part, "a preformed stator coil including a cluster of three phases of connected stator windings having ... bridge portions comprising circumferential portions connecting said axially parallel portions to each other within each of said three phases of windings." Claim 1 further requires that "inner circumferential surfaces of said bridge portions are placed at least close to the axial end surfaces of said stator core in the direction of the central axis of said stator core, so that the spatial ratio occupied by said stator windings belonging to said bridge portions exposed beyond said axial end surfaces of said stator core, has a high density."

With respect to independent claim 1, the Examiner acknowledges Adachi does not disclose a stator coil wherein inner circumferential portions of the bridge portions of the stator coil winding are placed at least close to the axial end surfaces of the stator, as claimed. However, the Examiner asserts that King, while not specifically applying to a preformed stator coil assembly, teaches "a three phase alternator with the bridge portions being close to the end of the stator to provide a generator with small axial dimensions and improved cooling." (Office Action dated June 11, 2002, page 3, first full paragraph).

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Appellant respectfully submits that Adachi in combination with King does not disclose, teach or suggest a preformed stator coil with bridge portions placed at least close to axial end surfaces of the stator core. Specifically, although the King reference may be somewhat relevant to the invention in that it discloses stator coils which are intended to lie close the stator core in the assembled state, the King reference is not relevant to a preformed stator coil, particularly a preformed coil where the coil ends are placed close to or contact the stator core without substantial gaps.

The Examiner relies upon King for its teaching of bridge portions or reaches extending in planes disposed closely adjacent to the opposite axial ends of the stator core or ring, as best shown in Figure 2 of the reference. In this particular stator, stator winding 22, 24 and 26 include a series of axially extending runs 22a, 24a and 26a disposed in every third slot in the stator core 18 and a series of circumferentially extending bridge portions 22b, 24b and 26b joining the ends of the runs 22a, 24a and 26a. The runs of a winding occupy slots different from the slots occupied by the runs of other windings (i.e., only one run per slot) and are positioned relative to one another so that no more than two bridge portions from different windings are juxtapositioned at any point about the axial end of the stator core. As a result, relatively small axial dimensions are possible in the final stator winding and more efficient heat dissipation is achieved. See column 2, line 36 - column 3, line 21 of the King reference.

Although the King reference may be somewhat more relevant than the previously cited Fujiwara and Glennon patents for the "contact" or "close to" feature, it still does not address the

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ability to form such a construction using preformed coils and a prefinished core. Indeed, the King reference appears to teach nothing at all regarding the use of either preformed coils or a prefinished core. This is important in the present context because, prior to the present invention, preformed stator coils, such as that disclosed by Adachi, could not be assembled to stator cores without significant gaps therebetween, without damage to the coils. (See page 5, lines 11-33 of Appellant's specification). While preformed coils in and of themselves, as well as individually wound coils with no gaps when assembled to a stator, might be argued to be known in the art, preformed coils without gaps, as claimed in Appellant's claim 1 are not known. Accordingly, Appellant respectfully submits the King reference is not properly combinable with Adachi and even if so combined would not accomplish Appellant's claimed invention.

Further, while individually wound coils might produce a winding assembly assembled to a stator core with no appreciable axial gaps, these individually wound coils also dramatically decrease the efficiency of stator manufacturing. This obviates the specifically stated purpose of Appellant's invention, as well as the reason for preforming the coil (as required by Appellant's claim 1 and the Adachi reference) in the first instance. See page 13, line 15 - page 16, line 8 of Appellant's specification. Thus, it is not obvious that one skilled in the art would modify Adachi according to King, because King teaches a winding of individually wound coils which teaches away from Adachi as well as Applicant's claimed invention.

The Examiner (page 4 of the Office Action dated June 11, 2002) asserts that the "arguments regarding a pre-formed coil is not persuasive because it is method of making

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limitation which is not germane to the patentability of the apparatus." However, Applicant respectfully submits that the Examiner's position is incorrect. First, the term "preformed" is not used in the "method" sense in the claims. Rather, the term defines the type of stator coils to which the invention is directed, and thus defines the apparatus. Second, one of ordinary skill in the art would not have been motivated to modify Adachi's stator (having a preformed coil) based on the teachings of King to produce the claimed invention since there is no teaching whatever that King's coils are preformed. Thus, to this extent, King teaches away from Adachi.

To establish a *prima facie* case of obviousness under 35 U.S.C. § 103, there must be some suggestion or motivation to modify to combine the reference teachings. "To support the conclusion that the claimed invention is directed to obvious subject matter, either references must expressly or implicitly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the reference." *Ex parte Clapp* 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). However, in the present case the Examiner has not provided any objective reasoning why one of ordinary skill in the art would have been motivated to modify Adachi in view of King. Moreover, the Examiner does not address how one of ordinary skill in the art would have been able to modify Adachi in view of King to produce the claimed invention since, prior to the present invention, preformed stator coils could not be assembled to stator cores without significant gaps therebetween, without damage to the coils.

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Thus, absent any evidence at all that the Examiner's combination of references could overcome, or even address this issue, there is no motivation to combine the two teachings, and, indeed, no indication whatever that the two references could be successfully combined, even if one were to attempt to do so. A proper §103 rejection requires both of these indicators, i.e., motivation to combine and a reasonable expectation of success. For this reason, Appellant respectfully submits that the §103 rejection of independent claim 1 clearly fails.

In view of the above, Appellant respectfully submits the teachings of Adachi and Glennon, whether taken alone or in combination, fail to teach or suggest Appellant's stator assembly as set forth above with respect to claims 1-4. Accordingly, the rejection of the claims should be reversed and the claims passed to issue.

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

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UNDER 37 C.F.R. § 1.192
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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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WASHINGTON OFFICE



23373

PATENT TRADEMARK OFFICE

Date: December 11, 2002

Attorney Docket No.: Q53565

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UNDER 37 C.F.R. § 1.192
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APPENDIX

CLAIMS 1-4 ON APPEAL:

1. (Four Times Amended) A stator for an automotive alternator comprising:
a stator core having a plurality of slots; and
a preformed stator coil including a cluster of three phases of connected stator windings having:
axially parallel portions which are substantially parallel to the central axis of said stator coil, said axially parallel portions comprising current generating portions disposed within said slots of said stator core and generating electric current, and projecting portions which project from the axial ends of said slots; and
bridge portions comprising circumferential portions connecting said axially parallel portions to each other within each of said three phases of windings;
wherein inner circumferential surfaces of said bridge portions are placed at least close to the axial end surfaces of said stator core in the direction of the central axis of said stator core, so that the spatial ratio occupied by said stator windings belonging to said bridge portions exposed beyond said axial end surfaces of said stator core, has a high density.
2. (Twice Amended) The stator for an automotive alternator according to Claim 1, wherein said stator core comprises:

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in a prefinished stator core, a plurality of comb-shaped strips each having a band portion; and

a plurality of teeth disposed substantially parallel to each other extending perpendicularly relative to the longitudinal direction of said band portion;

in the finished stator core, said plurality of strips being laminated and formed into a cylindrical shape; and

end surfaces of said teeth in said prefinished stator core being provided with grooves perpendicular to the longitudinal direction of said band portion and recessed portions on both sides of said teeth near said ends, so as to form circumferentially projecting portions in said finished stator core.

3. (Amended) The stator for an automotive alternator according to Claim 2, wherein said preformed stator coil is a flat planar shape prior to assembly with the finished stator core.

4. (Amended) The stator for an automotive alternator according to Claim 1, wherein said preformed stator coil is a flat planar shape prior to assembly with the finished stator coil.